

# Pain Management: Acute and Chronic

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## Course Objectives

Upon completion of this presentation participants should be able to:

- Discuss the definition of pain, its prevalence
- describe the pharmacology of opioids useful in the management of acute and chronic pain
- describe the pharmacological management of opioids used for treating acute and chronic pain
- Understand the 3-Step WHO guidelines
- Prescribe proper doses of opioids and adjuvants
- Anticipate and treat potential side effects
- identify the indications for a referral or consultation with a pain specialist.
- discuss the role of the various health care professionals in the management of pain

## Pain Facts

- 76.5 million Americans affected (26%)
- Annual cost to society 100 billion/year
- Low back pain-27%
- Migraine or severe headache- 15%
- Neck pain- 15%
- Pain is the most common complaint in primary care offices
- Uncontrolled pain = decreased quality of life and increased morbidity

Pain foundation website, 2007

## Pain Management Barriers

- It is often under-reported
- Fear of addiction
- Physician misinformation
  - Fear of respiratory depression with use of opioids
  - Fear of patient addiction
  - Fear of legal implications

## Pain Management Goals

- Treat acute pain aggressively and prevent chronic pain
- Identify and address the cause of pain
- Treat chronic pain continuously
- Improving function and sustaining quality of life
- Treat noninvasively as much as possible

## Acute vs Chronic Pain

- Pain is an unpleasant feeling that is conveyed to the brain by sensory neurons as result of injury, disease, or emotional disorder.
- Acute Pain
  - Less than 6 months duration
  - Cause is usually known
  - Disappears when the injury heals
- Chronic Pain
  - More than 6 months duration
  - Persists after injury heals
  - Cause may or may not be known

International Association for the study of pain website, 2007

## Types of Pain

- Neuropathic (burning, tingling, pins and needles sensation)
- Psychogenic
- Idiopathic
- Nociceptive (Bone, Muscle, Visceral)- tissue damage/injury, localized

## Pain Assessment

- Comprehensive H&P
  - Assess pain for duration, intensity, location, aggravating and relieving factors, prior meds used, family or personal history of drug or alcohol abuse-very important, patient's goal for pain control.
- Labs- CBC, CMP, ESR, B12, Folate, HgbA1C, FBS, Rheumatoid factor

- Diagnostics (MRI, EMG, CT,X-ray)

## Pain Assessment Tools

- Visual Analog Scale (VAS)
- Numerical Scale
- Pain Faces Scale
- Verbal Pain Intensity Scale
- Categorical Scale

NCCN website, 2007

## Non-Pharmacological Pain Management

- Transcutaneous Nerve Stimulation (TENS)
- Cognitive and behavioral therapy
- Heat and Cold
- Physical and occupation therapy
- Rehabilitation
- Progressive Muscle Relaxation
- Psychotherapy
- Complimentary Medicine (massage, Accupuncture and Accupressure)
- Exercise therapy
- Lifestyle changes

## Pain Management-Interventional

- Kyphoplasty/Vertebroplasty (with vertebral fractures)
- Epidural and caudal steroid injections (neck, back pain)
- Nerve root blocks and transforaminal injections (neck, back pain, migraines)
- Peripheral nerve injections (migraines, trigeminal neuralgia, shingles pain, localized pain, postsurgical incisional pain, post surgical neuropathic pain, localized neuropathic pain, muscle spasms)
- Disks and Discography (diagnostic, to find out where pain is originating)
- Radio-frequency lesioning (Rhizotomy)(neck, back pain)
- Spinal cord simulation (neck, back, arm, leg pain, or migraines)
- Spinal infusion/Spinal pumps (chronic pain)
- Sympathetic blocks (SRPS syndrome, shingles pain)
- Neurolytics of celiac plexus and cancer pain (abdominal pain)
- Surgery

# Pharmacological Management of Pain

## WHO Pain Treatment Ladder

- Mild Pain
  - Non-opioid Analgesics
  - Adjuvant Agents (optional)
- Moderate to Moderately Severe Pain
  - Weak opioid+ Non-opioid
  - Adjuvant Agents (optional)
- Severe Pain
  - Strong Opioid + Non-opioid
  - Adjuvant Agents (optional)

## Treatment of Mild Pain- NSAIDs

- NSAIDs- Cox-2 inhibitors (Celebrex), Mobic, Naproxen, Relafen, Elector (Diclofenac) patch 1.3%, Diclofenac topical (Voltaren Gel) 1% , Solaraze 3% gel (Diclofenac)
- Inhibit pain sensitivity caused by Cox-2 peripherally at site of injury and centrally at spinal cord.
- Do not block transmission of pain
- Ceiling affect- increase in dose does not increase analgesia but increases side effects.
- Risks- GI toxicity (bleeding), renal toxicity (with dehydration), cardiovascular risks
- The last resort for people with cardiovascular disease- AHA recommendation

## Treatment of Mild Pain- NSAIDs cont.

- Ketorolac (Toradol) 30mg IV q6h prn pain not to exceed total 5 days- use only for moderate to severe pain
- Voltaren Gel 1% (Diclofenac)
  - UE 2 g qid; Max 32g/day; Total 8g/joint/day
  - LE 4 g qid; Max 32g/day; Total 16g/joint/day
- Mobic 7.5 (qd or bid), 15mg mg qd. Not GI protective as Celebrex, but good choice if patient does not tolerate Celebrex.
- Relafen- harder on GI, good for acute pain for short term use
- Solaraze 3% gel (Diclofenac) tid prn
- Elector patch 1.3% bid

## Mild Pain Management- Acetaminophen (Tylenol)

- Centrally acting increases pain threshold
- Full mechanism of action not known
- Well-tolerated
- Minimal anti-inflammatory effects

- Fewer GI side effects than NSAIDS
- Risks- hepatotoxicity at high doses. Caution using with meds that increases P450 system activity (phenytoin, carbamazepine, rifampin, isoniazid, phenobarbital, barbiturates). Caution with alcohol use.
- Patients not to exceed 3 grams/day (for chronic pain)

## Adjuvants

- Lidoderm patch (Lidocaine 5%)
  - Indicated for peripheral neuropathy
  - 1-3 patches once daily for 12 hours
  - Well tolerated
- Capsaicin cream 0.025% or 0.075%
  - Tid/qid prn
- Muscle relaxants- Flexeril, Skelaxin, Baclofen, Robaxin, Soma
  - Sedation main concern
  - Bid, tid, qid dosing
  - Robaxin least sedating, followed by Skelaxin and Flexeril
  - Baclofen most effective but most side effects, start at slow doses
  - Soma very potent but can be addictive, give only short-term, unless all others failed

## Adjuvants cont.

- Anticonvulsants- Neurontin, Lyrica, Carbamazepine- for neuropathic component of pain or as adjuvants to pain medications
  - Neurontin- cheaper, tid/qid dosing, high dose titration, increased s/e, longer titration time.
  - Lyrica, expensive, newer, fast titration, bid/tid dosing, less s/e.
  - Carbamazepine- excellent medication for trigeminal neuralgia
  - Sedation and dizziness- the main concern these medications resolves over time.
  - Start at bedtime to deal with side effects

## Adjuvants cont.

- Antidepressants- Tricyclics, MAOIs, Serotonin Reuptake Inhibitors (Cymbalta).
  - Elavil- for depression, neuropathic component of pain and for insomnia. Do NOT give to patients with heart disease or emotionally unstable/suicidal. Check EKG prior ordering this drug. Can change cardiac conduction.

- Cymbalta works well for neuropathic component of pain and depression.
- Sedation is side effect for these medications

## Moderate to Severe Pain-Opioids

- Morphine Sulfate (Morphine, MSIR, MSContin, Roxanol, Kadian, Avinza) IR/ER
- Oxycodone (Oxycontin, OxyIR) IR/ER
- Oxymorphone (Opana) IR/ER
- Fentanyl (Duragesic) (IR/ER)
- Methadone
- Tramadol (Ultram, Ultracet) IR/ER
- Hydromorphone (Dilaudid) IR
- Hydrocodone/Acetaminophen (Vicodin, Lorset, Lortab, Norco) IR
- Percocet (Oxycodone/Acetaminophen) IR

## Moderate to Severe Pain-Opioids cont.

- Morphine Sulfate IR/SR
- Metaboline (morphine 3-glucuronide)
- Adverse events - seizures, myoclonus, pruritis, risk increased with low GFR
- Avoid in renal failure
  - SR- MS Contin, Kadian, Avinza
  - IR- MSIR, Roxanol, Morphine
    - MS Contin bid dosing can be given tid, about 30% immediate release component, not good choice for patients with history of drug abuse.
    - Kadian qd or bid dosing can be given through NG tube, no immediate release component better choice for patients with personal or family history of drug abuse
    - Avinza qd dosing can be given bid (but divide qd dose into bid dosing), about 10% releases immediately, good choice for patients with personal or family history of drug abuse to be given once a day.
    - Roxanol is liquid form given to those who have difficulty taking pills (used in hospice frequently)
    - MSIR starts at 15 mg do not give to opioid naïve patients

## Moderate to Severe Pain-Opioids cont.

- Methadone- tid/qid dosing
- NMDA antagonist, inhibits serotonin and norepinephrine, works well for neuropathic component of pain
  - Cheap
  - Very dangerous if patient is noncooperative, can result in death.
  - 36-72 hours half-life, sedation occurs day 2 or 3 taking medication main s/e.
  - Adverse events: sedation, dizziness, n/v, urinary retention, QT prolongation and multiple medication interactions with other meds (SSIRs, quinolones, Lyrica, TCAs, Rifampin, Phenytoin, Phenobarbital, some CCBs, macrolides, antiretrovirals, antifungals and others)
  - NOT a prn drug. Dosing tid/qid, effects last between 4-8 hours, onset within 30 minutes.
  - Quick dosing can result in death. Dosing start slow 2.5 mg bid/tid elderly, and 5 mg bid/tid adults then titrate every 4-7 days by 30-50%, watch patient reaction, sedation. See patient weekly for evaluation. Have office call a patient on days 2 and 3 and inquire regarding s/e.
  - Available in po, liquid and IV form.
  - IV form does not have 36-72 hour half-life, sedation effects are immediate. Potent drug for pain management.
  - Methadone gtt excellent for managing severe chronic pain, especially cancer pain can be managed within 24 hours and patient discharged to home.
  - 80% oral bioavailability
  - Lipophilic
  - Excretion mostly fecal therefore advantageous to use in renal failure

## Moderate to Severe Pain-Opioids cont.

- Fentanyl IR/SR- parenteral, transdermal, transmucosal, spinal, nebulized
- Lipophilic, high 1<sup>st</sup> pass effect, low oral bioavailability,
  - SR-Duragesic, transdermal patch q3day dosing
    - excellent choice for patients with memory problems
    - Excellent choice for patients with history of drug abuse
    - Less side effects than pills
    - Not a good choice if patient is active in sports, fever, obese due to altered absorption
  - IR- Fentora, and Actiq, transmucosal/buccal
    - For breakthrough cancer pain
    - No more than 4 doses a day. May redose in 30 minutes.
    - 200-400mcg Actiq=100mcg Fentora
    - Onset of action within 15 minutes
    - NEVER give to opioid naive patients, respiratory depression is a concern.
    - Actiq comes in lollipop form, suck between cheek and lower gum. Be very careful giving it to patients who have pets or children around. Start with 200 mcg/unit
    - Fentora comes in tablet form. Place the tablet above rear molar between upper cheek and gum and allow to dissolve. Do not chew, suck or swallow. Start with 100mcg.

## Moderate to Severe Pain-Opioids cont.

- Oxycodone IR/SR
  - SR- OxyContin bid/tid dosing
  - Renally safer than Morphine
    - About 37% is in immediate release form
    - Not a good medication for people with history of substance or drug abuse.
    - Can be given to opioid naive patients in severe pain (start at 10 mg bid)
    - Most sought after drug by drug abusers and on the market
    - Literature says it has the same potential for addiction as other long-acting pain medications- I tend to disagree based on my professional experiences.
  - IR-OxyIR
    - I usually give this drug if a patient is allergic to hydrocodone, failed hydrocodone, or cannot take tylenol (liver disease) in Percoset.

## Moderate to Severe Pain-Opioids cont.

- Opana (Oxymorphone HCl) IR/SR, bid dosing
  - Long half-life (9-11h)
  - Extended release (5, 10, 20,40mg)
- Opana IR (5, 10mg)
- NOT to be given to opioid naive patients.
- Not to be given if allergic to codeine (metabolite of oxycodone)
- Respiratory depression is a risk
- Strength 2x oxycodone, 3x morphine
- Must take 1 hour prior or after meals (can increase blood levels dangerously)
- Structurally related to hydromorphone (Dilaudid)
- Injectable form Numorphan/Opana inj (10mg/ml)

## Moderate to Severe Pain-Opioids cont.

- Hydromorphone (Dilaudid)- IR.
  - Synthetic opioid
  - Metabolite hydromorphone 3-glucuronide- same adverse events as Morphine but much more potent.
  - Caution with renal failure
- Hydrocodone (Vicodin, Lorcet, Lortab, Norco)-IR
- Acetaminophen/Oxycodone (Percocet)- IR

## Moderate to Severe Pain-Opioids cont.

- Meperidine (Demerol)- IR, use no more than 2-3 days, short half-life (2.5-3.5hours)
  - neurotoxic metabolite formation can cause seizures with impaired renal function.
- Tramadol (Ultram)- IR/SR, combination with acetaminophen (Ultracet), as potent as codeine
  - Mu-receptor agonist
  - Blocks reuptake of serotonin and norepinephrine
  - Caution with SSRIs or SNRIs risk of serotonin syndrome.
  - Adverse effects- somnolence, dizziness, seizures, HTN.
    - Ultram ER qd dosing 100, 200, 300
    - Ultram/Tramadol IR 50mg 1-2 po tid/qid prn (Can order Tylenol 325-500 mg with each dose if patient cannot afford Ultracet or if not on formulary)
    - Ultracet 1-2 po tid/qid prn- more expensive than Tramadol

## Moderate to Severe Pain-Opioids cont.

- IONSYS. Patient controlled transdermal system- new medication on the market
- Credit card size with 80 doses of fentanyl
- Pre-programmed and disposable
- Can be used for acute pain
- Battery charged system when used pushes pre-programmed amount into dermis
- Placed on upper outer area of chest where patient can reach the button
- Leave in place for 24 hours



# Managing Moderate to Severe Pain

- Give baseline medications round the clock
- Give 10% of total daily dose prn
- If taking more than 2 doses of prn's/24h then increase baseline by total of prn's
- Opioid naive patients stabilize pain with short-acting medications first
- ½ usual starting dose in special populations
  - Elderly 65 years or older
  - Patients with hepatic or renal disease
- Opioid Conversion
  - Calculate equianalgesic doses
  - Reduce the dose by 30-50%

## Opioids- Potential Risks

- Nausea, vomiting, stomach upset
- Respiratory depression
- Constipation
- Dizziness, delirium, amnesia
- Itching, hives
- Addiction, dependence, tolerance
- Hyperalgesia- pain out of proportion

## Managing Opioid Risks

- Most side effects resolve with continued use of medications except constipation.
- Treat constipation with laxatives, stool softeners (Colace, Pericolace, Miralax, Senocot, Senocot S), encourage patient to drink fluids and eat fiber rich foods
- Somnolence treat with stimulants (Provigil, Ritalin)
- Pruritis treat with antihistamines
- Respiratory depression- titrate medications slowly by 20-30%, in elderly (65 years or older) by 15-20%. "Start low, go slow". Narcan is the last resort only.
- Treat nausea, vomiting with nausea medications (Reglan, Zofran, Phenergan).

# Opioids

- Opioids can relieve moderate to severe pain
- No ceiling effect
- For continuous pain use long-acting meds
- For breakthrough pain use short-acting meds
- If taking meds 10 days or longer on regular bases withdrawal symptoms may occur, wean off meds slowly.

# Preventing and Managing Withdrawals

- Withdrawal results in hypertension, nausea, vomiting, body aches, diarrhea, anxiety, tremors, tachycardia, diaphoresis, abdominal pain.
- Preventing-Taper off meds slowly by 50% first 2-4 days, then by 20-30% every 2-4 days.
- Managing – Dr. Hilliard's RX
  - Clonidine (Catapres) 1 patch x7days #1
  - Librium 10 mg 1 po tid prn #21 or Klonopin 1 mg tid prn #21

# Equianalgesic Dose Table

- Morphine is used as a gold standard in opioid conversion
- Morphine 1 mg IV = 3 mg PO
- Dilaudid IV 20 times stronger than IV Morphine and PO 4-7 times stronger than PO Morphine
- Oxycodone PO 1.5 times stronger than PO Morphine
- Fentanyl patch 100 times stronger than Morphine
- 1 mg IV MSO4=10mcg IV Fentanyl=50mcg Actiq
- Intrathecal dose is 100 times stronger than IV dose
- Oxycontin 20 mg PO = Dilaudid 7.5 mg.

# Equianalgesic Dose Conversion

- Formula
  - $\text{current 24h dose divided by equivalent dose} = \text{new 24h dose divided by number of times drug to be given per day (bid, tid, qid)} = \text{new individual drug dose.}$
- Examples
- Converting Oxycontin to MS Contin
  - Patient is taking 60 mg bid MSContin. Total 24 hour dose = 120mg. Oxycontin is 1.5 times stronger than MSContin.  $120\text{mg} \times 1.5 = 180\text{mg Morphine/24 hours. } 180 \text{ divided by } 2 = 90 \text{ mg bid dosing}$
- Converting MSContin to IV Dilaudid
  - Patient is taking 60 mg MSContin/24h.  $60\text{mg divided by } 3 \text{ (po MSO4 } 3 \text{ mg} = 1 \text{ mg IV)} = 20 \text{ mg IV Morphine} \times 0.15 \text{ (dilaudid equianalgesic dose)} = 3\text{mg/day Dilaudid. } 3\text{mg divided by } 24 \text{ hours} = 0.125\text{mg basal rate dilaudid for PCA for continuous background long-acting med in addition to prn PCA Dilaudid.}$
- Converting MSContin PO to IV
  - Patient is taking MSContin 60 mg bid.  $60\text{mg} \times 2 = 120\text{mg/24h. } 120\text{mg divided by } 3 \text{ (3mg po Morphine} = 1 \text{ mg IV Morphine)} = 40\text{mg IV Morphine/24h. Morphine IV is given every hour. } 40\text{mg divided by } 24\text{h} = 1.66\text{mg/h can be given as basal rate to PCA in addition to PCA prn.}$

# Drug Dependency vs Addiction vs Pseudo-addiction

- Physical Dependence
  - Physiological Problem
- Addiction
  - Psychological Problem
  - Behavior Pattern of Drug Abuse
    - Hoarding medications
    - Seeking prescriptions from multiple providers
    - Requesting more medications
- Pseudo-addiction
  - Due to undertreatment of pain
  - Mimics addiction behavior
  - Resolves once pain is treated

## Preventing Drug Abuse

- Written consents/treatment agreements with patients
- Teach patients on how to dispose unused medications or request patients to bring unused medications and dispose them in your office
- Have guidelines in place on preventing diversion of prescribed medications
- Urine screening
- Regular visits and pill counts during those visits
- Know which pharmacy your patient uses to obtain medications
- Use patient risk assessment tools (CAGE, ORT, SOAPP)
- Use multidisciplinary approach- refer patients to other members of health care team- pain management specialist, addictionologist, OT/PT, Rehab, alternative treatment specialists.

## Pain Management- Legal Aspects

- DEA and licensing board scrutiny are a result of poor documentation
- Document, document, document- very important
- Must cover 5 areas when documenting
  - H&P
  - Informed consent and treatment agreement
  - Treatment plan
  - Reassess patient on regular bases
  - Consultation and referrals when needed ( pain management specialist, Rehab/physiatrist, OT/PT, addictionologist, psychologist, psychiatrist, alternative medicine etc).

## Pearls

- NEVER give long-acting opioids to opioid naive patients except Oxycontin 10 mg bid if patient is in severe pain and is poorly managed with PRN meds.
- Always start low and go slow
- When converting from one opioid to another always decrease dose by 25-50%
- When giving Narcan, dilute it with 10 cc NS and give it at 2 cc increments/min- will prevent rebound pain
- If patient has preference or insists on certain opioid that is a red flag (addiction maybe an issue).
- Any suspicion of drug abuse refer to psychologist for evaluation for drug abuse, if report confirms drug abuse refer to addictionologist
- Document, document, and document- very important

## Pearls cont.

- Patients with addiction are treated the same way as non-addicted patients, but they must see addictionologist, if history of alcohol abuse, must attend AAA meetings (must provide phone number for a group leader) monthly visits for f/u, and closer monitoring, avoid short-acting drugs and drugs with immediate release component (OxyContin, MSContin), Kadian, Avinza and Methadone are better choices
- Use combination of non-pharmacological modalities along with pharmacological modalities in treating pain
- Random urine drug screen at least twice a year-never let a patient know when it is going to occur. If patient states cannot give urine, then insist on serum drug screen
- Hold prescription until patient provides specimen for drug screen
- When titrating medications always start or add dose at bedtime first, that way if they have s/e they will sleep through them

## Pain Management

- Questions?

## Pain Management

- THANK YOU!